Butter Oil Absorption Study

Recently, Lauren AgriSystems completed a butter oil absorption study. Butter oil absorption or migration has always been a topic of interest when it comes to liners, due to the degradation of the liner, which is evident through its lifecycle. There is a visible change as well as a change in the mechanical properties of the liner as it is used.

Six liners were chosen for the study and 10 samples of each were used. Samples were cut from liner walls and weights were recorded. The butter was heated to 158°F (70°C) and impurities were separated to form butter oil. The samples were immersed in the butter oil and placed in an oven heated to 158°F (70°C) for a period of 24hrs. Samples were then removed and wiped with acetone to remove any butter from the outside of the samples. They were weighed and results were recorded. Samples were re-immersed and placed in the oven for a period of 15 days (360hrs.). They were then removed and wiped with acetone and weights were recorded.

Figure 1 shows the percentage of change in weights for each of the liners tested. Liners A through E were organic (black rubber) liners and liner F was the Lauren Tri-Circle® Silicone Liner. The results show (see photo) the black rubber liners gaining around 10% on the first day and around 40% by the 15th day. The data also shows the silicone liner with a slight gain at 1.13% the first day and another slight gain to almost 2% by the 15th day.

These results are indicative to the materials the liners are manufactured from. Silicones are commonly known to have better chemical resistance than organic rubber. This should have a direct impact on the life span of a liner and its performance over that time.

Figure 1. Percent weight gains for each sample (n = 10).

Sample	1 day (24hr)	15 days (360hr)
Liner A	9.82%	40.08%
Liner B	11.59%	40.53%
Liner C	17.14%	42.90%
Liner D	10.72%	41.26%
Liner E	13.02%	32.88%
Lauren Tri Circle	1.13%	1.92%